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DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
SOUTHWESTERN LAND OFFICE – ANACONDA UNIT

AVON EAST TIMBER SALE
ENVIRONMENTAL ASSESSMENT

Prepared by Will Wood, Forester/Economist, Forest Management Bureau, Missoula

July 1999

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CHECKLIST ENVIRONMENTAL ASSESSMENT

Project Name: Avon East Timber Sale Proposed Implementation Date: August 1999
 Proponent: Department of Natural Resources and Conservation, Southwest Land Office, Anaconda Unit

Type and Purpose of Action: The Montana Department of Natural Resources and Conservation (DNRC), Anaconda Unit, proposes the Avon East Timber Sale. This proposed action would harvest approximately 140-350 thousand board feet (MBF) and contribute approximately \$14,000 to \$35,000 into the State Trust Fund for Common Schools. Access would be from Highway 12. Temporary range roads and a short stretch of excavated road would be required. All new temporary and an old existing road would be rehabilitated and closed following the proposed management activities. The purpose of this project is to: 1) Produce revenue for the Public School Trust 2) Reduce the current stand density which would reduce tree competition and promote future growth. The project is located in section 36, T10N, R8W which is approximately 2 miles east of Avon. The 640 acres within the project area are owned by the State of Montana, managed by DNRC, and held in trust for the Common School Trust. Timber sale activities would likely begin in the late fall of 1999 and winter of 1999/2000. Current revenue generating activities are grazing, hay production and a home site.

Location: Section 36, T10N, and R8W County: Powell

I. PROJECT DEVELOPMENT

1. PUBLIC INVOLVEMENT, AGENCIES, GROUPS OR INDIVIDUALS CONTACTED: Provide a brief chronology of the scoping and ongoing involvement for this project.	A public notice of the proposed project was posted at the Avon Store, sent to the current leasee, adjacent landowners and interested parties for soliciting input (January 1999). Those involved from the Department of Natural Resources and Conservation include: Rose Leach, Wildlife Biologist; Jeff Collins, Soil Scientist; Patrick Rennie, Archaeologist; Gray Frank, Hydrologist; and Steve Kamps, Lead Timber Management Forester. Comments and concerns were addressed and incorporated into this EA. A brief list issues and concerns that were raised watershed, soils, wildlife (T&E Species, sensitive), aesthetics, impacts to current grazing lease, weeds, archaeological sites, and old growth.
2. OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED:	No other governmental agencies have jurisdiction. No other permits were needed.

<p>3. ALTERNATIVES CONSIDERED:</p>	<p>Two alternatives were developed for this project, a no-action alternative and an action alternative which are described as follows;</p> <p>1) No Action Alternative - This alternative provides the baseline for comparing the environmental consequences of the action alternative. Under this alternative, no timber would be harvested and no income from timber harvesting would go to the Common School Trust. Existing land uses such as hay production, grazing, recreation and a home site would continue to occur. The current Douglas-fir stands would continue to reduce their percent crown and increase in relative density. There would be less opportunity for ponderosa pine to regenerate. Aspen populations would be likely to continue to decline. Encroachment of Douglas-fir into the grazing land would also be likely to continue.</p> <p>2) Action Alternative - Approximately 100 acres would be harvested using commercial thinning, selective harvesting and several small areas of seed tree harvesting. The estimated harvest volume would be between 140-350 MBF. Timber harvesting would be designed to thin densely stocked Douglas-fir stands located in the draws found on the section, and to create openings around aspen clumps and ponderosa pine trees to promote regeneration. The targeted diameter range for the harvest trees would be from 7 to 18 inches DBH. Some trees over 20 inches would be harvested. Temporary range roads and a short stretch of excavated road would be required. All new temporary and an old existing road would be rehabilitated and closed. Encroachment of Douglas-fir into the grazing land would also be likely to continue.</p>
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II. IMPACTS ON THE PHYSICAL ENVIRONMENT	
RESOURCE	[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES N = Not present or No Impact will occur. Y = Impacts may occur (explain below)
<p>4. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE: Are fragile, compactible or unstable soils present? Are there unusual geologic features? Are there special reclamation considerations?</p>	<p>[Y] The primary forest soil is 95F Yreke gravelly loams on 35-60% slopes. Slopes < 45% are suited for conventional skidding harvest. Slopes over 45% have severe limitations to tractor harvest due to potential for excessive displacement and erosion. Potential impacts to the soil resource are compaction, excessive displacement and erosion. Steep slopes within the harvest units would require winch or cable harvesting to protect the soil resource. The equipment restriction zones would be marked. Season of use restrictions (dry condition in the fall or frozen soils in the winter) would be required. If all specialist recommendations and mitigations as well as Best Management Practices (BMP's) were implemented they would minimize the area of effect and protect soil resources. Refer to Attachment B:1 for soil existing conditions, direct, indirect and cumulative environmental effects. No cumulative soil effects are expected with implementation of mitigations noted above. No unique or unstable geology was observed within the proposed harvest areas.</p>

<p>5. WATER QUALITY, QUANTITY AND DISTRIBUTION: Are important surface or groundwater resources present? Is there potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality?</p>	<p>[Y] The proposed harvest area is drained by three unnamed ephemeral draw features which contain limited segments of discontinuous stream channel. All three drainage features go subsurface or disperse overland and are eventually intercepted by an irrigation ditch. The irrigation does not have direct return flow to any other streams or other bodies of water. Harvesting with a winch or a cable system would occur in portions of the SMZ. Equipment restriction zones would be marked and the SMZ law would be adhered to. No downstream sediment delivery to the Little Blackfoot River or other bodies of water would be anticipated. Erosion control measures aimed at stabilization of abandoned roads and improvements to the existing road system would be implemented. There is little risk of adverse impacts to downstream beneficial uses occurring as a result of the proposed action. Refer to Attachment B:2 for watershed conditions and direct, indirect, and cumulative environmental effects. The SMZ would be marked for equipment restriction zones, draw crossing would be designated and no draw crossing would be located within 200 feet of each other. A current grazing lease covers the entire project area. Effects of grazing on native vegetation and riparian areas will be evaluated at the time of lease renewal. See the project file for a copy of the last lease inspection report. No cumulative watershed effects are expected.</p>
<p>6. AIR QUALITY: Will pollutants or particulate be produced? Is the project influenced by air quality regulations or zones (Class I airshed)?</p>	<p>[Y] State Hazard Reduction Standards would be met by burning some of the slash in landing, trampling and lopp and scatter tops. All burning would take place under the coordination of the Montana Cooperative Airshed Group and would comply with all state air quality standards.</p>

<p>7. VEGETATION COVER, QUANTITY AND QUALITY: Will vegetative communities be permanently altered? Are any rare plants or cover types present?</p>	<p>[N] This project area is currently surrounded by large private ranches. See Attachment A. The area south of the highway is mostly dominated by native range land. There is evidence of some past harvesting in this section. The stands that would be harvested are currently 95% Douglas-fir with a few ponderosa pine and aspen and cottonwood. The structure of the stands is heterogeneous with an average DBH = 13, height = 57, stand age 110, trees per acre (greater than 7 inches) = 209 and Basal area = 125 square per acre. The estimated conditions post harvesting is: trees per acre (greater than 7 inches) = 95 and Basal area = 66.5 square per acre. The crown density in about 50-70% of the forested area would be reduced. The prescriptions are designed to promote a desired future stand conditions that are more open where most of the existing large trees would be retained. The post harvest stand condition would likely be similar to the stands conditions found in this part of Montana in the later part of the 1800's. See project file for a more in-depth write-up. To protect the site productivity for future tree growth, the fine slash will be retained by either hand felling or return skidding the tops (with mechanical skidding). Vegetative communities that occur within the project area would still be present after the completion of the project. No cumulative vegetation effects are expected. No growth is present in the project area. See the Luke Warm Environmental Analysis for old growth write-up related to the Anaconda Unit.</p> <p>Search of the Montana Natural Heritage's list of plant species of special concern yielded no plants located in the proposed project area. If any plants were identified during implementation DNRC would shut down operation in the immediate area, a botanist consulted and recommendations followed.</p> <p>There are currently occurrences of nap weed in the project area. The following mitigations are recommended: require equipment to be power washed before coming on to the site, log areas that are not infested first; spray current occurrences of weeds post logging and revegetate, require logging to be completed within one operating season and monitor the site for a couple of years following completion of logging operation. These mitigations should limit the potential for the spread and introduction of noxious weeds into the project area.</p>
<p>8. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS: Is there substantial use of the area by important wildlife, birds or fish?</p>	<p>[N] The project area provides habitat for a wide variety of wildlife. Field reconnaissance indicated use of the area by white tailed deer, elk, moose, mountain lion, coyotes (including two denning sites) and birds. Habitat security is moderately high in the project area but is negatively affected by the close proximity of a state highway. Refer to Attachment B:3 (Wildlife) for existing conditions and direct, indirect, and cumulative effects.</p>

RESOURCE	[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES
9. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES: Are any federally listed threatened or endangered species or identified habitat present? Any wetlands? Sensitive Species or Species of special concern?	<p>[N] The potential impacts to federally listed threatened or endangered species is very low due to retention of large trees, reduced stress on the remaining trees, no permanent roads, retention of snags, or lack of suitable habitat for the species. See the Attachment B:3 Wildlife Habitat Evaluation. Logging crews would be cautioned to keep the maximum distance possible between their activities and roosting eagles.</p> <p>If, any endangered, threatened, sensitive species, or other raptor nests were encountered during project planning or implementation, habitat protection measures would be implemented after consultation with DRNC biologist. These could include buffers around activity centers, timing restrictions, and habitat protection measures as described in the State Forest Land Management Plan.</p> <p>Streamside Management Zones (SMZ's) and Equipment Restriction Zone (ERZ's) would be used to exclude equipment from within these zones.</p>
10. HISTORICAL AND ARCHAEOLOGICAL SITES: Are any historical, archaeological or paleontological resources present?	[N] A records search was completed and no recorded cultural resource sites were found in the Avon East Timber Sale area. The archaeologist, after looking at the topo maps of the project area recommended no additional archaeological investigative work. See project file.
11. AESTHETICS: Is the project on a prominent topographic feature? Will it be visible from populated or scenic areas? Will there be excessive noise or light?	[Y] This project area is viewable from nearby residences and the highway. The prescribed treatments would not dramatically change the appearance of the area. Some change in forest density would be expected. Excessive noise or light would not be expected to result from the project implementation.
12. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY: Will the project use resources that are limited in the area? Are there other activities nearby that will affect the project?	[N] The resources on this parcel are not unique to the area. The proposal is not expected to adversely effect any existing uses.
13. OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA: Are there other studies, plans or projects on this tract?	[N] There are two DNRC proposed timber sales north of the Highway, McKay Creek and Lukewarm (see vicinity map). Additionally, Avon South #2 is a DNRC sale that has been sold and is 1 mile south of this section. Because of the natural fragmentation in the area and the relatively large distance (6 miles) from either McKay Creek or Lukewarm Creek timber sale, those actions would not contribute to any cumulative effects resulting from this proposed action. Avon South #2 timber sale is in closer proximity to the proposed sale area but would not likely contribute to cumulative effects due to the naturally fragmented landscape (small forested patches are separated by extensive grassland habitat) and retention of large-sized trees post-treatment. No measurable negative cumulative effects are likely. No old growth being cut, so no impact at the unit level.

III. IMPACTS ON THE HUMAN POPULATION

RESOURCE	[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES
14. HUMAN HEALTH AND SAFETY: Will this project add to health and safety risks in the area?	[N] Logging trucks and other vehicles would be entering the highway. The highway would be posted with warning signs regarding truck traffic. In order to prevent the movement of cattle onto the highway, the purchaser would be required to either use temporary cattle guards or operate during a time when no cattle are present. The logger would be responsible for closure of the cattle during logging operations.

III. IMPACTS ON THE HUMAN POPULATION

15. INDUSTRIAL, COMMERCIAL AND AGRICULTURAL ACTIVITIES AND PRODUCTION: Will the project add to or alter these activities?	[N] Logging operations may damage fencing. DNRC would require the purchaser to fix any fence that would be damaged before the cattle return. Also, a performance bond would be required as part of the contract. There could be a potential impact (soil compact, not removing the temporary ditch crossing or lose of hay production from the temporary range road) to the existing hay meadow. Access across the existing hay meadow would be only allowed in late fall or winter. No driving across hay meadow when the field is being irrigated or growing hay. The ditch crossing would be removed no later than April 15.
16. QUANTITY AND DISTRIBUTION OF EMPLOYMENT: Will the project create, move or eliminate jobs? If so estimated number.	[N]
17. LOCAL AND STATE TAX BASE AND TAX REVENUES: Will the project create or eliminate tax revenue?	[N]
18. DEMAND FOR GOVERNMENT SERVICES: Will substantial traffic be added to existing roads? Will other services (fire protection, police, schools, etc) be needed?	[N] There would be a temporary increase in Highway use adjacent to this section during harvesting operations. This added traffic would not increase the need for government services such as traffic control, snow plowing, or road maintenance.
19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS: Are there State, County, City, USFS, BLM, Tribal, etc. zoning or management plans in effect?	<p>[Y] The State Forest Land Management Plan (SFLMP) was completed and an alternative was selected by the Board of Land Commissioners in June of 1996. The State Forest Land Management Plan provides the general framework as well as policies and guidelines for managing forested trust lands. Omega, the selected alternative, is based on the premise that the best way to produce long-term income for the trust is to manage intensively for healthy and biologically diverse forests (SFLMP Record of Decision, pg. 1)</p> <p>The State Forest Land Management Plan does not address specific projects and related project-level issues and concerns. The State Forest Land Management Plan defines the Resource Management Standards which guided the planning of this proposed action. The philosophy and appropriate resource management standards have been incorporated into the design of the proposed action.</p>
20. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES: Are wilderness or recreational areas nearby or accessed through this tract? Is there recreational potential within the tract?	[N] Given the proposed harvest treatments the potential for future uses (other than the traditional use farming, grazing and timber) would be maintained for recreational activities. No wilderness or recreational areas are nearby or accessed through this tract.
21. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING: Will the project add to the population and require additional housing?	[N]
22. SOCIAL STRUCTURES AND MORES: Is some disruption of native or traditional lifestyles or communities possible?	[N]
23. CULTURAL UNIQUENESS AND DIVERSITY: Will the action cause a shift in some unique quality of the area?	[N] None have been identified.

III. IMPACTS ON THE HUMAN POPULATION

24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES: Is there a potential for other future uses for easement area other than for timber management? Is future use hypothetical?

[N] The estimated stumpage for this project is \$100 per MBF. Given the estimated range of 140-350 for harvest, the estimate return to the trust is in the range of 14,000 to 35,000. The cost, revenues, and estimates of return are estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of return. The costs related to the administration of the timber sale program are only tracked at the land Office and Statewide level. We don't keep track of project-level costs for individual timber sales.

Given the proposed harvest treatments the potential for future uses (other than the traditional use farming, grazing and timber) would be maintained. There is future potential for development due to it location near an existing highway and panoramic views of the Flint Mountain Range from parts of this section.

EA Checklist Prepared By: William Wood Forester/Economist 7/12/99
Name Title Date

IV. FINDING

25. ALTERNATIVE SELECTED:

I select the action alternative #2 for implementation, which involves harvesting approximately 140-350 MBF from approximately 100 acres utilizing primarily temporary range roads. The action alternative meets the project objectives of producing revenue for the Public School Trust and reducing current stand densities. This alternative also meets the resource management standards in the State Forest Land Management Plan and other applicable state laws. It would thin the existing stands to improve individual tree vigor and growth and bring the stands back toward conditions that were more likely present historically. This action alternative provides the most benefit while producing minimal impacts to the resources. I adopt all of the specialists recommendations and mitigations.

26. SIGNIFICANCE OF POTENTIAL IMPACTS:

Impacts from implementing the action alternative are found to be insignificant, and resource concerns are easily mitigated with commonly used and easily applied practices.

27. Need for Further Environmental Analysis:

☐ EIS ☐ More Detailed EA ☒ No Further Analysis

EA Checklist Approved By: Steven B. Kamps Lead Timber Management Forester
Name Title

Steven B. Kamps 7/20/99
Signature Date

AVON EAST TIMBER SALE
VICINITY MAP
SECTION 36 T. 10 N. R. 8 W.



, scale 1:62500
date 1/12/99

Proposed sale area —

R 8 W

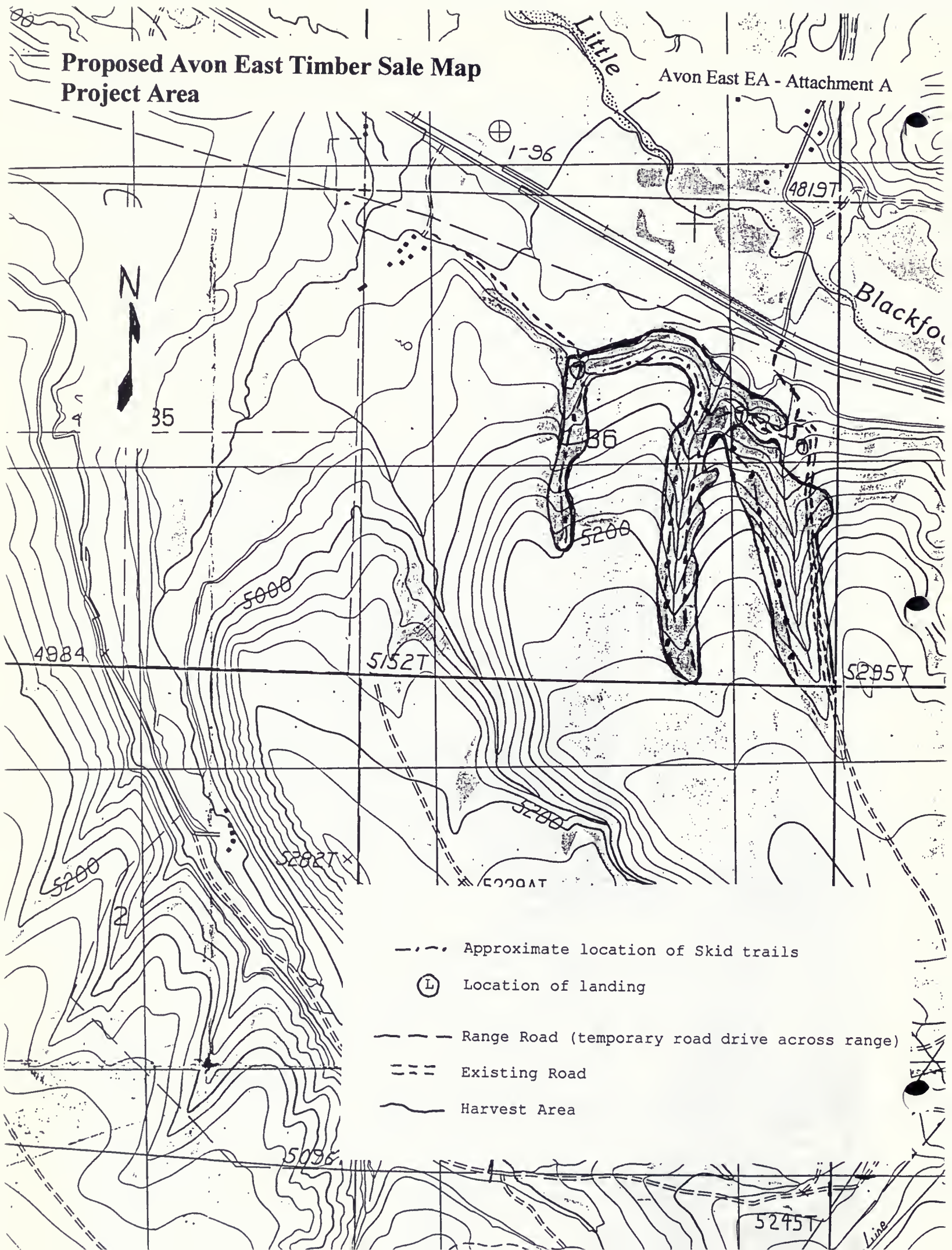
R 7 W



T 10 N

Proposed Avon East Timber Sale Map Project Area

Avon East EA - Attachment A



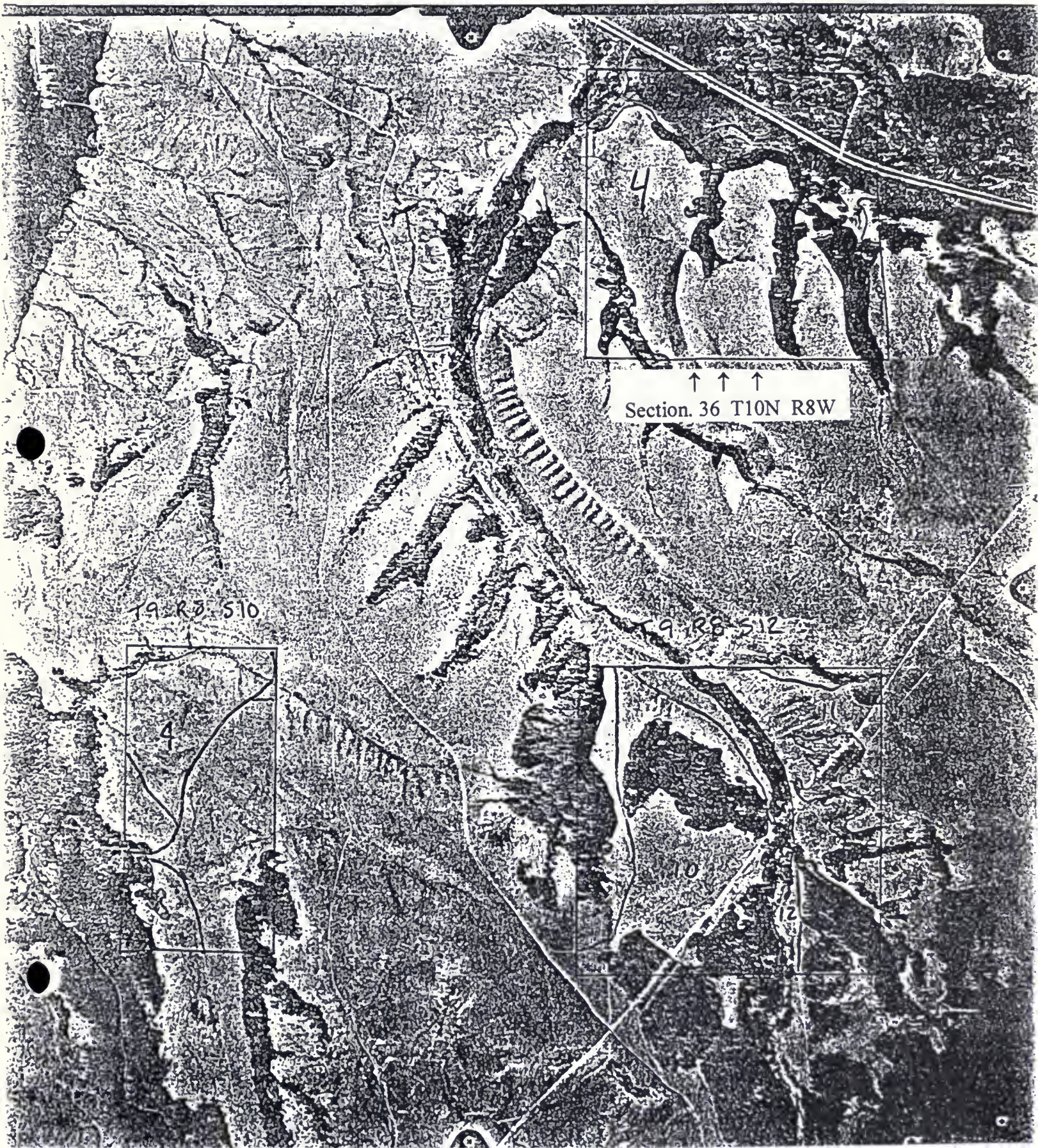
--- Approximate location of Skid trails

(L) Location of landing

--- Range Road (temporary road drive across range)

== Existing Road

~ Harvest Area



April 23, 1999

552

TO: WILLIAM WOOD, Avon East Project Leader
BILL SCHULTZ, Supervisor, State Land Management Section
GARY FRANK, Hydrologist

FROM: JEFF COLLINS, Soil Scientist

SUBJECT: AVON EAST TIMBER SALE, Revised Soils, Geology Report

The Avon East project area is located on moderate to steep slopes with soils weathered from deep tertiary age valley fill deposits, volcanic bedrock, shale, and some limestone. No especially unique or unstable geologic formations were noted in the proposed harvest area. A localized area of marginal stability (<1 acre) was noted on a steep draw in the general project area, but no harvest or road construction are proposed in or adjacent to this spot, and no effects to geology are expected with either alternative.

2.) Soils

Dominant soils in the forested harvest area are 95F Yreka deep gravelly loams and silty clay loams forming in tertiary valley fill sediments on slope of 35-60%. Soils information was derived from the Powell County Soil Survey, draft. Riparian and wet site soils are mainly limited to narrow strips adjacent to streams. The Yreka soils have about 4-12 inches of gravelly loam topsoils over deep very gravelly clay loams. This mapping unit has higher percentage of clay rich soils than the gravelly loam would indicate. Higher cobble content and rocky materials occur in the tops of draws where drainage's are geologically downcut. Erosion potential is moderate, except for steeper slopes >45%. Soils are susceptible to rutting and compaction if operated on when wet. Soils are mainly well drained and are droughty. The site is best suited to Douglas fir (44 Site index) and Ponderosa pine (less than SI 50). Downed coarse woody debris levels are average to high.

Most productive timber sites are on north aspects and slopes up to 45% which are well suited to conventional ground skidding equipment. Slopes over 45% have severe limitations to tractor harvest due to potential for excessive displacement and erosion. Some short steep slopes on the project area are too steep for tractors and would require winch or cable harvest. Plant competition is a concern, especially on southerly aspects and during dry years.

ENVIRONMENTAL EFFECTS

The No-action alternative would have little effect on soil resources. A short segment of existing road with inadequate drainage would continue to erode without maintenance.

Harvest Effects of action alternative

The primary risks to long term soil productivity are rutting and displacement of surface soils on steep, slopes by equipment operation and road construction. Potential effects are increase in

erosion, difficulty with regeneration and reduced growth. Effects to soils would be controlled, and soil productivity maintained by limiting tractor operations to slopes less than 45%. Skidding and hauling operations are planned for fall or winter conditions when soils are frozen or relatively dry. Erosion can be controlled by standard drainage practices. There is adequate coarse woody debris on the ground, but fine slash should be retained for nutrient cycling. To minimize impacts to soils, maintain soil productivity, and protect water quality, it is recommended that the action alternative would implement BMP'S and site specific mitigation measures of Soil Scientist and Hydrologist to protect soil and water resources.

Cumulative Effects to Soils

Cumulative effects could occur from repeated entries into the harvest area. Past harvest by selective logging in the project area has left minimal effect on soils with few trails still evident. Implementing the following mitigation measures presents low risk of cumulative effects.

HARVEST DESIGN MITIGATION MEASURES OF ACTION ALTERNATIVE:

- * Limit equipment operations to periods when soils are frozen, snow covered or relatively dry, (less than 20%) to minimize soil compaction and rutting, and maintain drainage features. Check soil moisture conditions prior to equipment start-up.

- * The logger and sale administrator will agree to a general skidding plan prior to equipment operations.

- * On steep slopes over 45%, complex terrain and along the incised draws, locate equipment restriction zones ERZ's, as needed to protect soils from erosion.

- * Slash Disposal- Brush piling operations are planned to retain organic matter, avoid displacement of topsoils and restricted by season of use to minimize effects. Consider lop and scatter, jackpot burning or trampling of brush. Tractor piling is not recommended on slopes over 30%. Every effort should be made to retain tops and fine litter for nutrient cycling.

Road Access & Effects of action alternative:

Clay rich soils of low bearing strength occur along portions of the proposed road access routes, mainly on grassland sites. The extensive nature of the clay soils can be impassable when wet, and makes all-season road design with gravel surfacing economically prohibitive. This would limit road construction and hauling to periods when soils are relatively dry or frozen to maintain road drainage. One segment of existing road is deeply rutted and is eroding.

Road access is planned for temporary use, minimum standard, fall/winter, drive across roads. Short segments of road excavation and construction will be needed on sideslopes to provide a level driving surface for safety during hauling operations.

Timber hauling should be limited to periods when soils are relatively dry or frozen to avoid rutting, maintain drainage and limit the need for gravel. Road surface drainage features would be installed where soils are disturbed and on the short rutted segment of road to control erosion.

Temporary roads and the irrigation ditch crossing would be closed after use, have drainage features installed where needed, and reseeded with site adapted grasses.

Road construction mitigation measures:

- * Install proper and adequate road drainage such as drain-dips to control erosion from existing road and new roads where soils are disturbed.
- * Road closures- Following use, install adequate surface drainage, closure features and grass seed to control erosion.
- * To maintain slope stability and encourage prompt revegetation, cut slopes should be constructed at -1/2 to 1 for rock and 1 to 1 for common material where roads are excavated >3ft.

Weed Management

Existing noxious weeds are small outbreaks of houndstongue and thistle with some knapweed. With no action, weeds could continue to spread along roads and possibly onto grassland areas, the highest risk sites of weed encroachment. The grazing licensee is responsible for controlling weeds and ideally their control measures would contain or reduce weeds.

With the action alternative, ground disturbing activities of road construction and timber harvest have the potential to introduce or spread noxious weeds in susceptible habitats. The action alternative considered an Integrated Weed Management (IWM) approach as required by Weed law as amended by HB 395. For this project prevention and revegetation measures are the considered the most effective weed management treatments. Road construction is minimal and roadside disturbance would be promptly revegetated. Implementation of the following IWM measures for all action alternatives would limit the possible spread of noxious weeds:

- * All road construction and harvest equipment would be cleaned of plant parts, mud and weed seed to prevent the introduction of noxious weeds. Equipment would be subject to inspection by forest officer prior to moving on site.
- * All newly disturbed soils on road cuts and fills would be promptly reseeded to site adapted grasses to reduce weed encroachment and stabilize roads from erosion.
- * DNRC would monitor the site for two years (in combination with other land management activities) after the project for noxious weeds. Any new weed occurrences on State Lands within the project area would be denoted and site specific control measures planned for.

7/1/99

TO: Will Wood, Forest Management Bureau

From: Gary Frank, Hydrologist

RE: Watershed Report for Avon EA

Chapter 3 - AFFECTED ENVIRONMENT

Watersheds

The proposed timber sale is located in an area of partially forested range foothills which lie directly above the Little Blackfoot River valley bottom near Avon, MT. This area is drained by three unnamed ephemeral draw features which contain limited segments of discontinuous stream channel. Collectively these features drain a watershed area of approximately 525 acres. Channelized flow in all three drainage features goes subsurface or disperses overland and is eventually intercepted by an irrigation ditch. The irrigation ditch is used for flood irrigation and does not have direct return flow to any other streams or other bodies of water.

There is no evidence of direct channel delivery from the proposed sale area to the Little Blackfoot River. Portions of these drainage features containing discernable stream channels are considered Class III streams under the Montana Streamside Management Zone Law and Rules.

Regulatory Framework

This portion of the Clark Fork River basin, including the Little Blackfoot River is classified B-1 in the Montana Surface Water Quality Standards. The B-1 classification is for multiple use waters suitable for domestic use after conventional treatment, growth and propagation of cold water fisheries, associated aquatic life and wildlife, and agricultural and industrial uses. Among other criteria for B-1 waters, no increases are allowed above naturally occurring concentrations of sediment which will harm or prove detrimental to fish or wildlife.

"Naturally occurring" includes conditions or materials present from runoff on developed land where all reasonable land, soil and water conservation practices have been applied. Reasonable practices include methods, measures or practices that protect present and reasonably anticipated beneficial uses. The State has adopted Forestry Best Management Practices through its Nonpoint Source Management Plan as the principle means of controlling nonpoint source pollution from silvicultural activities.

The segment of the Little Blackfoot River located near the proposed project area has been identified as water quality limited water bodies in the 1998 update to Montana's 303(d) list. The 303(d) list was compiled by the Montana Department of Environmental Quality as required by Section 303(d) of the Federal Clean Water Act and the EPA Water Quality Planning and Management Regulations (40 CFR, Part 130). Under these laws, the State is required to identify water bodies that do not fully meet water quality standards or those where beneficial uses are threatened. Such streams or lakes are referred to as "water quality limited". Federal laws also require that those waterbodies listed are to be targeted for Total Maximum Daily Load (TMDL) development. The TMDL process is used to determine the total allowable amount of pollutants in a waterbody or watershed. Each contributing source is allocated a portion of the allowable limit. These allocations are designed to achieve water quality standards.

The Montana TMDL Law (MCA 75-5-701) also directs the Department of Environmental Quality to assess the quality of state waters and to develop TMDL for waters identified as threatened or impaired. Under the Montana TMDL Law, new or expanded nonpoint source activities affecting a listed water body may

commence and continue provided they are conducted in accordance with reasonable land, soil and water conservation practices.

This segment of the Little Blackfoot River is on the 303(d) list because the cold water fishery and aquatic life support beneficial uses are determined to be only partially supporting. The "partially supporting" status refers to: Beneficial uses that are not being supported at natural or best practical levels. This is a broad designation, used in situations ranging from slightly impaired water bodies to those in which a water body is barely supporting a designated use. The probable causes of impairment in this segment of the Little Blackfoot have been identified as flow alteration, nutrients, other habitat alterations and siltation. The probable sources of impairment have been identified as agriculture, highway / road / bridge construction, irrigated crop production, pasture land and resource extraction.

The unnamed discontinuous drainages located within the proposed harvest area have not been specifically designated as "water quality limited" waterbodies on the 303(d) list.

Cumulative Watershed Effects - Existing conditions

Each of the three draw features draining the proposed sale area was evaluated to determine existing watershed conditions and the potential for cumulative watershed impacts. These evaluations included field reviews conducted to: 1) Inventory stream channel condition and stability, 2) Determine existing road conditions, 3) Identify potential source of sediment, and 4) evaluate existing levels of forest cover and range encroachment using a course filter approach to determine the potential for increased water yields.

A small amount of timber harvests have occurred in with the proposed sale area in the past 30-50 years.

Those areas previously harvested were evaluated and determined to be hydrologically recovered due to the current high stocking levels and degree of canopy closure. These stands are presently stocked at higher levels and carrying higher basal areas than would be expected under conditions occurring prior to fire suppression due to a lack of thinning from periodic low intensity wildfires. Range encroachment is also occurring resulting in greater amount of forest cover in the drainage area than would be expected under natural conditions.

Forest canopy probably has minimal influence on the timing and intensity of runoff in this watershed. The area is only partially forested with most of the drainage area consisting of range foothills and grassland valley bottoms. The estimated forest cover is approximately 23 % of the watershed area.

Channel stability and erosion potential were also evaluated in the ephemeral drainage features. Some segments of draw bottom are moderately incised having down cut approximately 1-3 feet. Large amounts of bedload movement and deposition are evident in several segments in the draw bottom where ephemeral flows disperse overland across benches or valley bottom fan features. These characteristics are due to the gully erosion and associated headcut advancement common observed in this region area. The causes of these erosional features is likely a combination of recent high intensity runoff events (July 1998, 1997 runoff and 1996 runoff), historic skidding practices, and past grazing management.

Water Quality

The extent of existing erosion, fine sediment and bedload transport and deposition is limited and localized to isolated segment of ephemeral draw bottom. Impacts to water quality and downstream beneficial uses are not evident at this time due to the discontinuous nature of the drainage features occupying the proposed sale area, adequate buffering provided by hay fields located in the valley bottom, and the lack of direct surface connectivity to the Little Blackfoot River or other surface water resources.

Cold water fisheries

There are no fish bearing streams nor stream suitable for fisheries habitat occurring in the immediate vicinity of the proposed harvest units.

ENVIRONMENTAL EFFECTS

Cumulative Watershed Effects

A coarse filter approach was utilized to evaluate the potential for additional cumulative effects from the proposed action occurring in the three unnamed ephemeral draws features draining the proposed project area. This approach utilized 1988 BLM air photo coverage of the project area, USGS 7.5 minute quad map coverage of the area, DNRC stand level inventory data, and information provided by the publication "Historical Vegetation of Montana" by B.J. Losensky, 1997. A detailed cumulative watershed effects analysis was not completed due to the discontinuous nature of the isolated segments of Class III stream channels draining the project area.

There is low risk of additional cumulative watershed effects occurring due to the proposed activities due to increased water yield or sediment yield. The potential for increased water yield and increased peak flows is low due to the following: 1) Downstream peak flow increases are not likely to occur in these drainage features due to the discontinuous nature with subsurface or dispersed runoff regimes; 2) the minimal influence that the limited amount of total forest cover has on runoff regimes occurring in these predominately rangeland watersheds; 3) the existing forest stands are well stocked with basal area and canopy cover levels greater than would be expected under natural or pre-fire suppression conditions; 4) the presence of a considerable amount of range encroachment which has actually increased the amount of forested area over what would not be expected under natural conditions; and 5) the proposal utilizes a selective harvest prescription that attempts to emulate natural process more reminiscent of pre-settlement pre-fire suppression. These treatments would result in a residual stand that retains a considerable amount of canopy cover and basal area.

There is also low risk of cumulative watershed effects from increased sediment yields resulting from the proposed action. See the section titled "Water Quality" for a complete discussion of considerations utilized to minimize risk of additional sediment delivery. No detrimental impacts due to cumulative watershed effects are expected to result from the activities proposed.

Water Quality

The principle concern with the potential impacts of timber harvest on water quality is accelerated sediment delivery to streams or other bodies of water. Most published studies indicate that forest management activities have limited, if any effects on in stream nutrient levels. In general, increases nutrient concentrations due to forest harvesting are uncommon unless those harvest are accompanied by high intensity burns. In those studies that reported elevated nutrient concentrations, other factors were determined to be of overriding importance (Salminen and Beschta, 1991).

Increases in water temperature of fish bearing streams or streams supporting other aquatic life are not likely to result from the proposed action. The proposed sale area only contains limited segment of discernable stream channel which are ephemeral and discontinuous. These stream segments only contain seasonal channelized flow in response to snowmelt runoff or precipitation events. There is no direct channel conveyance to the Little Blackfoot River or other streams or bodies of water.

Harvest units can directly impact water quality if not properly located or buffered. The risk of sediment and nutrient delivery is highest for activities conducted adjacent to streams, wetlands and lakes. The proposed harvest areas are drained by ephemeral draws with limited and discontinuous segments of Class III stream

The Montana Streamside Management Zone Law and Rules regulates forest management activities that occur adjacent to drainage feature that contain discernable stream channels. All proposed harvest activities would be conducted in accordance with the SMZ Law and Rules. All areas requiring SMZ delineation will be reviewed by a DNRC hydrologist to determine their adequacy in meeting the requirements of the law, and in protecting water quality and aquatic resources. A selective harvest prescription and equipment operation restrictions would be utilized to protect all ephemeral draw bottoms, springs and isolated wet areas. Slash piles and landings will not be located in ephemeral draw bottoms. Prescribed fires for hazard reduction will be excluded from all SMZ's, ephemeral draw bottoms and other areas subject to concentrated surface runoff. There is low risk of downstream sediment delivery due to these mitigation measures and the discontinuous nature of the Class III stream channels draining the proposed harvest area.

The primary risks to water quality are those associated with roads, especially roads constructed along or crossing streams. The proposed access and haul route would primarily utilize non-excavated temporary drive across range roads. These roads would have waterbars installed, grass seeded, and permanently abandoned after use. Less than 0.1 mile of temporary road would be constructed that would actually require excavation. This would include construction of a temporary drive-thru crossing of an irrigation ditch during an inactive season of use. The ditch would be rehabilitated back to its original configuration after the use of the crossing. This ditch is used for flood irrigation and does not have direct return flow to a stream or other body of water. There is overland flow to a pond.

The existing road located within the proposed project (east side of the section) is located on a sustained steep grade. This road is in poor condition and does not meet minimum BMP standards. Less than 0.1 mile of this road will be used to access a proposed landing site. The portion used would be improved to a standard that fully complies with minimum BMPs. The remaining 3,000 feet of existing road would be rehabilitated to control erosion and permanently abandoned.

DNRC will utilize all feasible BMPs, mitigation and erosion control practices during the improvement, reconstruction and construction of all roads, ditch and draw crossings. Site specific design recommendations of DNRC hydrologist and soil scientist will be fully implemented under both of the action alternatives. Some short term erosion may occur at the crossing of the irrigation ditch and ephemeral draw bottoms during or shortly after construction activities. Application of BMPs, site specific designs and mitigation measures would reduce erosion and potential water quality impacts to an acceptable level as defined in the water quality standards. Acceptable levels are defined under the Montana Water Quality Standards as those conditions occurring where all reasonable land, soil and water conservation practices have been applied.

No downstream sediment delivery to the Little Blackfoot River or other bodies of water is anticipated. Erosion control measures aimed at stabilization of abandoned roads and improvements to the existing road system are expected to result in long term improvements to watershed conditions within the proposed project area. There is little risk of adverse impacts to downstream beneficial uses occurring as a result of the proposed action.

MEMORANDUM

To: Will Wood,
From: Rose Leach, Wildlife Biologist, SWLO
7/2/99

WILDLIFE HABITAT EVALUATION—Proposed Avon East Timber Sale

Location: S 36 /T10N /R8W

Field Visit Date: 10/30/98

Size: approximately 120 acres of forested area located in 4 stringers along highway 12.

Elevation Range- 4,800 to 5,200 feet

Area Description:

Section 36 is composed of a wet meadow in the lowlands, grassland habitat along ridges, occasional clumps of aspen, and stringers of timber located along north-facing slopes and draws. Most forested stands are composed of small to medium sized Douglas-fir (7-14 inches d.b.h.) with dense understories. In addition, stands have scattered relic large Douglas-fir (and to a lesser extent ponderosa pine) over 20 inches d.b.h. Fire suppression has allowed understories to become more dense than would have occurred historically. Scattered medium- to large-sized stumps occur in the stands as well. The area is potential winter range, used in winters with severe weather (Dan Hook, pers. com.). Habitat security is moderately high in the project area, but is lower than expected because of the close proximity of a state highway. The highway is located in the northeast corner of the section, and runs between the forested stands and the Little Blackfoot River. The hayfield area is adjacent to the highway. Two of the forested stringers each had a coyote den in excavatable soils near their respective SMZ areas.

The analysis area for this proposal includes section 36 and surrounding sections that are immediately adjacent. Cumulative effects analysis covers past and current actions in the vicinity, including Avon South #2 Timber Sale, and the proposed McKay Creek and Luke Warm Timber Sales. Cumulative effects are discussed in the text and summarized in Tables 1-3.

Proposed Action:

The DNRC proposes to harvest section 36 using commercial thinning and perhaps 2-3 small (no larger than 1.5 acres) seed tree units. (If used, the seed tree units would be open after harvest, except for remnant clumps of green trees.) The project area would be in three stringers out the total of four (approximately 100 acres total). Trees proposed for harvest include mostly intermediate Douglas-fir, and some ponderosa pine. Trees targeted for harvest would range from 7 to 18 inches d.b.h. and are suppressed. They are located either in the understory or are co-dominant with the overstory. Approximately 50% of the current volume would be removed. All ponderosa pine and Douglas-fir over 20 inches would be retained, except those that would be removed incidentally for safety, or road, skid trail, or landing placement. This includes trees with forked tops, decay, or a "wolf" appearance. To minimize ground disturbance, harvest activities would occur in late fall or winter. Access to the trees would be on temporary skid-trail type roads and on

an existing road. Except for stream crossings, no machinery would be operated within 50 feet of streams but harvest would occur. Machinery would cross at designated crossings as allowed by the SMZ law on class 3 streams. However, trees in the SMZ that are anchoring the usually dry stream channel would be retained. Aspen located near areas to be harvested may be cut or knocked down, to stimulate regrowth. If aspen is treated, slash would be piled in the area to protect sprouts from overgrazing by livestock. In other portions of the proposal area, slash would be retained on site, and lopped and scattered. All snags would be retained, unless they were a danger to safe operations.

Mitigations: If any endangered, threatened, sensitive species, or other raptor nests are encountered during project planning or implementation, habitat protection measures would be implemented. These would include buffers around activity centers, timing restrictions, and habitat protection measures as described in the State Forest Land Management Plan.

Wildlife-Related Concerns:

Retention of **old trees, overstory cover, snags, and downed woody debris** are concerns, because many species of wildlife including endangered, threatened, and sensitive species are associated with these habitats. For example, large live trees generally have large crowns, which contribute to overstory cover and provide important diversity in otherwise open habitats in the area. During severe winters, overstory cover would be important to big game species for snow interception, security, and thermo-regulation. Over 50 species of wildlife depend on snags or coarse woody debris for nesting, roosting, feeding or loafing sites. Nearly 100 species, including bats, small mammals, amphibians, furbearers, woodpeckers, raptors, passerines, and waterfowl are known to use snags or coarse woody debris (WDFW 1995). In general, large snags and woody material are more preferred and last longer than small snags and small coarse woody debris. In addition, several wildlife species are associated with old growth habitats, including brown creeper, Vaux swift, golden-crowned kinglet, northern goshawk, and marten (Leach et al. 1992:92-93, Henjum et al. 1994:184). These species could be expected in the proposal area.

The 4 habitat resources (old trees, overstory cover, snags, and downed woody debris) are inter-related, particularly in a small area such as the proposal. For example, large trees generally become old growth trees, which eventually become large snags and ultimately coarse woody debris. Therefore, the 4 habitats are discussed as one issue for this document, termed “**large-sized trees**”. Timber harvest can remove large-sized trees, which could affect the associated habitat components of old trees, overstory cover, snags, and downed woody debris. As a result, associated wildlife species could be affected.

Affected Environment—Large-sized Trees

Large-sized trees that provide overstory cover and future old growth, snags and coarse woody debris habitat are scattered throughout the section in all 4 stringers. However, none of the stands are mapped as old growth, because most stands are dominated by trees less than 150 years old. The scattered large-sized trees are mostly Douglas-fir at least 18 inches d.b.h., with an occasional ponderosa pine. Historically, the area probably

experienced frequent cool underburns and some mixed severity fires. Currently, the understory is more dense than would have been expected with frequent cool fires. Large-sized snags are rare, probably resulting from past logging and firewood cutting. In addition, large pieces of coarse woody debris are scarce.

The surrounding sections are mostly grassland, although some timbered draws occur. Coniferous forest cover in adjacent sections is less extensive than in section 36, however. In addition, an extensive hardwood riparian area approximately ½ mile wide occurs along the Little Blackfoot River adjacent to the proposal area.

The nearest DNRC harvest activity occurs 1 mile south of the proposal area, in the Avon South #2 Timber Sale. This area is under contract for harvest now. Harvest activities would be similar to those described for the Avon East proposal (Avon South EA, DNRC, SWLO). The proposed McKay Creek and Luke Warm Timber Sales are each at least 6 miles from the proposal area. McKay is scheduled for sale in 1999 and Luke Warm in 2000.

Environmental Consequences—Large-sized Trees

No Action

Without harvest, suppressed trees would continue to grow. Large-sized trees would experience increased competition stress. Eventually, this may cause large-sized trees to die and become snags. This would benefit the snag resource, but decrease the live overstory cover resource. Without thinning, however, there would be fewer medium-sized trees to continue to grow to become future large-sized trees, and eventually large snags and coarse woody debris. Without thinning, overstory cover provided by large trees would decrease and be replaced by trees with smaller crowns. Snow interception would decrease as a result. Without thinning, fuels would increase and increase the risk of stand-replacing fire. In summary, there would be no direct effect to large-sized tree habitat by this proposal. There may be a future cumulative decrease in large-sized tree habitat, due to continued competition stress.

Harvest

Thinning suppressed trees would reduce competition stress. Large-sized trees should be able to live on the site longer than if stands were not thinned. Overstory cover and snow interception would decrease somewhat. However, because the largest trees would be retained post-harvest, effects would be mitigated. In addition, snow interception should continue into the future, because remaining trees should respond to increased sunlight, and large trees would be retained on site longer than without thinning. The recruitment of large-sized snags and coarse woody debris should continue uninterrupted, because large trees would be retained, and because medium-sized trees would be encouraged to grow into larger sizes. Old growth components would not be substantially reduced, because snags and large trees would be retained. If snags were dropped for safety considerations, they would remain on site as coarse woody debris. Coarse woody debris may decrease initially, if pieces are broken down during harvest activities. However, slash would be created by harvest activities, to somewhat mitigate this effect. Because mostly hand falling (versus a mechanical harvester) would be used, large rotten pieces of

wood would remain on site, rather than being pulled into a landing. This should help mitigate decreases in coarse woody debris as well.

In summary, there would be a small direct effect to large-sized tree habitat by this proposal, because some medium-sized trees would be removed by harvest. However, retaining all trees greater than 20 inches d.b.h. (except those removed incidentally for safety or skid trail placement) would mitigate negative effects. There would be a future cumulative benefit to large-sized tree habitat, from thinning suppressed trees and reducing competition stress. Because of natural fragmentation in the area and the relatively large distance (6 miles) from either McKay Creek or Luke Warm timber sales, those actions would not contribute to any cumulative effects resulting from this proposed action. The Avon South #2 timber sale could potentially contribute to cumulative effects, because it is only 1 mile from the proposal vicinity. However, the area is naturally fragmented, so that small forested patches are widely separated by extensive grassland habitats between Avon South #2 and Avon East. In addition, similar harvest is planned at Avon South #2, so that large-sized trees would be retained on site post-treatment. Section 12 of Avon South #2 is the closest parcel to the Avon East proposal area. Section 12 would include 30 unentered acres of mature ponderosa pine and Douglas-fir. Therefore, no negative cumulative effects to large-sized tree resources are expected as a result of this proposal.

Table 1. Potential Cumulative Effects to Wildlife-Related Issues

Issue	Alternative A, No Action	Alternative B, Harvest
Large-sized Trees	<ul style="list-style-type: none"> • Snags would increase in the short-term, due to competition. • Future cumulative decrease in large-sized tree habitat, due to continued competition. • Crowns would be smaller, so snow interception would decrease. • Eventually, large-sized snags and coarse woody debris would decrease. 	<ul style="list-style-type: none"> • Future cumulative benefit to large-sized tree habitat, from thinning suppressed trees and reducing competition stress. • No likely cumulative effects from either McKay Creek or Luke Warm timber sales, due to natural fragmentation and long distance (6 miles) between those sales and this proposal. • The Avon South #2 timber sale could potentially contribute to cumulative effects, because it is only 1 mile from the proposal vicinity. Mitigated by: <ul style="list-style-type: none"> • Naturally fragmented area, so that small forested patches are separated by extensive grassland habitats between Avon South #2 and Avon East. • Similar harvest planned at Avon South #2, so that large-sized trees would be retained on site post-treatment • Section 12, the nearest portion of Avon South #2 to the proposal vicinity, would include 30 unentered acres of mature ponderosa pine and Douglas-fir. <p>Therefore, overall no negative cumulative effects to large-sized tree resources are expected as a result of this proposal.</p>

Threatened and Endangered Species Considerations

Affected Environment—Bald Eagle, Peregrine Falcon

Bald eagles and peregrine falcons (both Federally-threatened species) could occur in the project area. Adult bald eagles have been seen during winter in the area, roosting near the Little Blackfoot River. Eagles could use the proposal area during spring as well, to forage on winter killed carrion. Bald eagles could potentially nest in the proposal area. Nest trees are usually large conifers, often ponderosa pine that can support a large stick nest. Nests are generally located within sight of a large water body or river. The Montana Natural Heritage Database lists a bald eagle nest north of the proposal area in section 25.

Peregrine falcons are associated with large cliff faces and wetland or riparian habitats that produce prey such as waterfowl and shorebirds. Although waterfowl occur along the river, they probably would not be in large enough concentrations to support peregrine falcons. Appropriate cliffs do not occur in the area.

Environmental Consequences-No Action

Bald Eagle and Peregrine Falcon.

Although waterfowl occur along the river, they probably would not be in large enough concentrations to support peregrine falcons. In addition, appropriate cliffs do not occur in the area. Therefore, peregrine falcons would not be affected, either directly or cumulatively, by this proposal.

Without harvest, suppressed trees would continue to grow. Large-sized trees, potentially used for bald eagle roosting or nesting, would experience increased competition stress. Eventually, this may cause large-sized trees to die and become snags. This would benefit the snag resource, which could be used by eagles for roosting or nesting. However, snags would not stand as long on site as live trees would. Also, without thinning, there would be fewer medium-sized trees to continue to grow to become future large-sized trees, and eventually large snags. Without thinning, overstory cover provided by large trees would decrease and be replaced by trees with smaller crowns. These trees may not become large enough to support nesting or roosting eagles. In addition, without thinning, fuels would increase and increase the risk of stand-replacing fire. However, fires would need to be carried through open grassland habitats for all of the stringers to be affected.

In summary, without harvest there would be no direct change to bald eagle habitat, and no potential disturbance from harvest activities. There could be a cumulative decrease in habitat, however, as large-sized trees are lost from the site.

Environmental Consequences-Harvest Bald Eagle and Peregrine Falcon

Although waterfowl occur along the river, they probably would not be in large enough concentrations to support peregrine falcons. Appropriate cliffs do not occur in the area. Therefore, peregrine falcons would not be affected, either directly or cumulatively, by this proposal.

No trees adjacent to the river would be harvested in the proposal and all large trees (except those removed incidentally) would be retained in the harvested stands. These could provide potential bald eagle nest or roost trees. Thinning under large trees would decrease competition stress and encourage longer occupation of the site by large live trees. This would benefit potential bald eagle habitat. Harvest activities would conclude before spring and before the time that eagles would begin nesting activities. The proposed harvest is located too far from (and out of sight of) the nest in section 25 to affect that site. Harvest activities may potentially disturb eagles roosting in the proposal area during winter. However, ample habitat would remain in the unentered stringers in section 36 and along the river. In addition, eagles can become habituated to human activities, and indeed currently use the area in spite of the close proximity of a state highway with considerable traffic. Therefore, disturbance during winter should be minimal. Logging crews would be cautioned to keep the maximum distance possible between their activities and roosting eagles. With mitigations listed above, no direct or cumulative negative impacts to bald eagles are expected to occur as a result of this project. There may be a cumulative benefit to eagle habitat by retaining large trees on site with thinning. McKay, Luke Warm, and Avon South #2 are too distant from the proposal area and from permanent water to contribute to cumulative effects to Bald Eagle habitats from this proposal.

Affected Environment-Grizzly Bear and Gray Wolf

Grizzly bears (federally-threatened) and gray wolves (federally-endangered) could use the proposal area. Both forage on small mammals and big game. Grizzly bears also forage on seasonally-available plants, particularly those found in riparian areas and avalanche chutes. Riparian habitat is adjacent to the proposal area, but the presence of a state highway decreases its potential use by grizzly bears. No avalanche chutes occur in the area. The proposal area is winter range, and could support big game during severe winters. However, the proposal area is only 100 acres, and a state highway runs through the best winter range habitat. Therefore, the habitat effectiveness of the area for winter range is lower than similar areas that are more extensive and located away from highways. Thus, the capacity of the area to support big game is already low. For these reasons, the area has low habitat value for grizzly bears and wolves as well. Therefore, although grizzly bears and wolves could use the area, it does not provide preferred habitat for either species.

Environmental Consequences-No Action, Grizzly Bear and Gray Wolf

Without harvest, use of the area by small mammals and big game would remain as at present. In addition, relative security would remain the same. Because the area does not provide preferred habitat for either grizzly bears or wolves, there would be no direct or cumulative negative effects to either species with this alternative.

Environmental Consequences—Harvest, Grizzly Bear and Gray Wolf

Harvest could occur in the area, which is classified as potential winter range, during winter. This could disturb big game, an important potential prey for both grizzly bears and wolves. However, disturbance would be of short-duration because activities would likely last only 1-1.5 months. During that time, big game could be displaced. However, the extent of the harvest area—only 100 acres—is small compared to the entire winter range area. In addition, the presence of the state highway makes the proposal area currently poor winter range habitat for big game. Therefore direct negative effects to big game (and therefore to grizzly bears and wolves) would at most be slight. Harvest activities may occur during fall or during a mild winter, so that there would be no effect to wintering big game. No permanent roads would be built, so security would remain as at present—relatively high in the forested stands, but lowered because of the close proximity of the state highway. Thinning suppressed trees would encourage continued growth of large overstory trees—a benefit to big game cover and snow interception. No riparian areas with permanent water flow, or avalanche chutes would be affected by the proposed harvest. Thus, there would be no change to these grizzly bear habitat components. Therefore, no measurable direct effects are expected to occur to grizzly bears or gray wolves as a result of this project.

The proposed McKay Creek and Luke Warm Timber Harvests are both 6 miles distant from the Avon East proposal area, and neither is located in preferred habitats for grizzly bears or wolves. In addition, effects to big game have been mitigated in both proposals. Section 12 of Avon South #2 is located 1 mile from the Avon East proposal area. However, Section 12 would include 30 unentered acres of mature ponderosa pine and Douglas-fir. Also, effects to big game have been mitigated in that proposal as well.

Therefore no cumulative effects are expected to occur to grizzly bears or gray wolves as a result of this project.

Table 2. Potential Cumulative Effects to Threatened and Endangered Species

Species	Alternative A, No Action	Alternative B, Harvest
Bald Eagle	Potential cumulative decrease in habitat as large-sized trees are lost from the site, due to competition stress.	Potential cumulative benefit to eagle habitat by retaining large trees on site with thinning. McKay, Luke Warm, and Avon South #2 (other proposals in the vicinity) are too distant from the proposal area and from permanent water to contribute to cumulative effects to Bald Eagle habitats from this proposal.
Peregrine Falcon	No potential peregrine falcon habitat, so no cumulative effects	No potential peregrine falcon habitat, so no cumulative effects
Grizzly Bear	Use by small mammals and big game (prey species), and would remain as at present. Relative security would remain the same. The area does not provide preferred habitat for grizzly bears, so there would be no cumulative negative effects.	The proposed McKay Creek and Luke Warm Timber Harvests are both 6 miles distant from the Avon East proposal area, and neither is located in preferred habitats for grizzly bears. In addition, effects to big game have been mitigated in both proposals. Section 12 of Avon South #2 is located 1 mile from the Avon East proposal area. However, section 12 would include 30 unentered acres of mature ponderosa pine and Douglas-fir. Effects to big game have been mitigated in that proposal as well. Therefore no cumulative effects are expected to occur to grizzly bears as a result of this project.
Gray Wolf	Use by small mammals and big game (prey species), and would remain as at present. Relative security would remain the same. The area does not provide preferred habitat for gray wolves, so there would be no cumulative negative effects.	The proposed McKay Creek and Luke Warm Timber Harvests are both 6 miles distant from the Avon East proposal area, and neither is located in preferred habitats for gray wolves. In addition, effects to big game have been mitigated in both proposals. Section 12 of Avon South #2 is located 1 mile from the Avon East proposal area. However, section 12 would include 30 unentered acres of mature ponderosa pine and Douglas-fir. Effects to big game have been mitigated in that proposal as well. Therefore no cumulative effects are expected to occur to gray wolves as a result of this project.

Sensitive Species Considerations

Pileated Woodpecker-Affected Environment

Pileated woodpeckers may occur in the proposal area. However, they are associated with stands dominated by mature to old growth ponderosa pine or western larch. The birds prefer large-sized ponderosa pine and western larch snags and coarse woody debris for feeding, roosting and nesting. Although individual old ponderosa pine trees occur in the section, pine-dominated stands and larch trees are absent. The proposal area is mostly composed of Douglas-fir, not preferred for nesting by pileated woodpeckers, but occasionally used. Therefore, the area would not be considered prime habitat for pileated woodpeckers.

Environmental Consequences

Alternative A—No Action

There would be no direct changes to pileated woodpecker habitat. Without thinning, the few large-sized ponderosa pine present would continue to decline. Recruitment of these species as snags would create a direct benefit to pileated woodpecker habitat. However, positive effects would be short-lived, because without thinning, this tree species would not be recruited to the stands. In fact, ponderosa pine would likely be permanently lost. This would cause a net cumulative decrease in pileated woodpecker habitat over time.

Alternative B-Harvest:

The proposal would retain all of the ponderosa pine (and Douglas-fir) greater than 20 inches d.b.h. No snags would be removed, unless they were a danger to safe harvesting operations. Some pieces of coarse woody debris would be recruited to stands by lop and scatter methods. Therefore, the limited amount of preferred pileated woodpecker habitat present (ponderosa pine) should not be directly decreased. Ponderosa pine would increase gradually, due to thinning. Benefits would be 2-fold: decreased competition stress, and increased seedling establishment (by opening stands and scarifying sites). No permanent roads would be built so that security for snags should remain as it is now. Thus, there would be no appreciable negative direct or cumulative effects to this species as a result of this project. There would be a cumulative benefit for maintaining and recruiting preferred ponderosa pine with thinning. The proposed McKay and Luke Warm sales are located 6 miles from the Avon East proposal vicinity—likely too far to contribute to negative cumulative effects to pileated woodpeckers. The Avon South #2 sale area is only 1 mile from the Avon East proposal area, but intervening habitats are grassland, and therefore not potential pileated woodpecker habitat. Thus, these activities would not contribute to cumulative effects to pileated woodpeckers.

Flammulated Owl

Affected Environment

Flammulated owls occur in mature to old growth ponderosa pine and mixed pine and Douglas-fir stands. The birds nest in cavities excavated by other species, preferring cavities excavated by pileated woodpeckers where available. Nest trees in 2 Oregon studies were at least 20 inches d.b.h. (cited in McCallum 1994). Habitats used have open to moderate canopy closure (30 to 50%) with at least 2 canopy layers, and often are adjacent to small clearings. In addition, stands used often have a shrub understory. An open forest structure with shrubs contributes to producing insects, the main prey of flammulated owls. Few large-sized ponderosa pine trees occur in the vicinity, and stands of old growth ponderosa pine are absent. Although preferred habitat is low, flammulated owls could use the Douglas-fir stands and adjacent openings in the project area. However, the low number of snags and coarse woody debris limits habitat suitability.

Environmental Consequences

No action

Without harvest, trees would continue to die and be recruited into snags. This would benefit flammulated owls. However, without thinning, fewer ponderosa pine would be recruited to the area, and medium-sized trees would not be encouraged to grow into

larger size classes necessary to support flammulated owls. Therefore, there would be a cumulative decrease in habitat over time. Thickets (roosting habitat) would increase, but without suitable nesting structures, roosting habitat could go largely unused. Therefore a net negative cumulative effect may occur to flammulated owls without harvest.

Harvest

The proposal would retain all of the ponderosa pine and Douglas-fir greater than 20 inches d.b.h. Therefore, over time large-sized ponderosa pine snags would be recruited into the area. In addition, the proposal would remove suppressed Douglas-fir from pine trees, thus promoting continued growth of pine. No snags would be removed, unless they were a danger to safe harvesting operations. These actions would increase potential flammulated owl nesting habitat in the area. Although thickets would decrease with harvest, birds could find suitable roosting habitat in the unentered stringers. Thus, no appreciable direct or cumulative detrimental impacts to this species are expected to occur as a result of this project. A net positive cumulative effect is expected to occur due to thinning under large-sized ponderosa pine and retaining large-sized healthy and cull ponderosa pine. The proposed McKay and Luke Warm sales are located 6 miles from the Avon East proposal vicinity—likely too far to contribute to negative cumulative effects to flammulated owls. The Avon South #2 sale area is only 1 mile from the Avon East proposal area, but intervening habitats are extensive grassland, and therefore probably not potential flammulated owl habitat. Thus, these activities would not contribute to cumulative effects to flammulated owls.

Columbian Sharp-Tailed Grouse—Although the proposal area contains grassland habitat, it is unlikely that Columbian Sharp-tailed Grouse occur in the area. This bird is native to the Columbia Basin (i.e., west of the Continental Divide) where it uses shrub-steppe habitats and associated riparian areas. Forested stands are not used. The bird has been extirpated from most of its former range (Marks and Marks 1987), and the closest potential population is located near Ovando, MT (over 50 miles away). If any sharp-tailed grouse are found in the area, actions would stop until a biologist has assessed the possibility that birds are Columbian sharp-tails. Mitigation measures such as lek protection or timing restrictions would be implemented at that time.

Ferruginous Hawk

Affected Environment

This bird is associated with dry grassland habitat such as those in the project area. The birds generally nest in coniferous or deciduous trees, but can nest on elevated ground, ledges, rock outcrops, power-line towers, haystacks, or other elevated structures (Dobkin 1992). Breeding is suspected in the latilong that includes the project area (Bergeron et al. 1992).

Environmental Consequences

Alternative A-no harvest

With no harvest, there would be no change to potential Ferruginous Hawk habitat. Large trees may be lost with time, but the birds could likely still find suitable nest sites. There would be no direct or cumulative effects to this species with this alternative.

Alternative B—Harvest

Harvest would likely not affect nesting, because work would occur in the fall or winter. There are no winter locations for this species in this latilong (Bergeron et al. 1992), although birds could occur there. If present, birds could be disturbed during winter. However, disturbance duration would be short—1 to 1.5 months, and localized—limited to grasslands adjacent to the entered stringers of timber. Therefore, there should be no adverse effects to wintering birds from disturbance. Suitable nest trees would be available after harvest, because large trees would be retained, and because thinning would reduce competition stress to remaining trees. Therefore, there would be no direct or cumulative effects to this species with this alternative. Other current or proposed sales in the vicinity are too distant (at least 6 miles away, McKay and Luke Warm), or would not affect grassland habitats (McKay, Luke Warm, Avon South #2), so that no cumulative effects would be expected.

Mountain Plover—This species occurs in native shortgrass prairie habitats that are generally flat and often have prairie dog towns. Although grasslands occur in the project area, they are not the types preferred by mountain plovers. There are no breeding locations for this bird in this latilong (Bergeron et al. 1992), although there are breeding records east of this latilong. Therefore, this bird probably would not occur in the project area. Thus, there would be no direct or cumulative effects to this species with either alternative.

Townsend's Big-eared Bat—There are no known caves (wintering habitat) in the vicinity, so this species would not likely occur. Snag habitat (potentially used for summer roosting) is in the area. However, without winter habitat (caves) available, it is unlikely that this species would occur in the area.

Environmental Consequences

Alternative A--No action. Without harvest, snag habitat would remain as is currently, and would gradually increase with tree competition stress. No roads would be built, so habitat security would remain high. However, without thinning, the supply of large-sized snags (preferred for maternal roosts) would decrease with time.

Environmental Consequences

Harvest. With harvest, there would be a slight decrease in snag habitat, if any are removed for safety reasons or incidentally to harvest. Without those conditions, no snags would be removed. Thinning would decrease stress and increase retention of large trees over time. Large-sized trees are the forerunners to large snag habitat. Given the low possibility of finding Townsend's Big-Eared Bat in the area, negative direct and cumulative effects to this species would be unlikely. Two other proposed sales in the vicinity (McKay and Luke Warm) are too distant--at least 6 miles away--to contribute to negative cumulative effects for this species. Avon South #2 timber sale is within 1 mile of the proposal area. Harvest there (section 12) would include 30 unentered acres of mature ponderosa pine and Douglas-fir. In addition, large-sized trees would be retained post-harvest, so there would likely be no cumulative negative effect.

Table 3. Potential Cumulative Effects to Sensitive Species That May Occur in the Project Area

Species	Alternative A, No Action	Alternative B, Harvest
Pileated Woodpecker	Ponderosa pine would not be recruited to stands and may eventually be lost. This would cause a net cumulative decrease in pileated woodpecker habitat over time.	Cumulative benefit for maintaining and recruiting ponderosa pine with thinning. The proposed McKay and Luke Warm sales are located 6 miles from the Avon East proposal vicinity—likely too far to contribute to negative cumulative effects to pileated woodpeckers. The Avon South #2 sale area is only 1 mile from the Avon East proposal area, but intervening habitats are grassland, and therefore not potential pileated woodpecker habitat. Thus, these activities would not contribute to negative cumulative effects to pileated woodpeckers. All 3 proposals favor retention of ponderosa pine and therefore would have a net cumulative benefit to pileated woodpeckers.
Flammulated Owl	Fewer ponderosa pines would be recruited to the area, and medium-sized trees would not be encouraged to grow into larger size classes necessary to support flammulated owls. Therefore, there would be a cumulative decrease in habitat over time.	A net positive cumulative effect is expected to occur due to thinning under large-sized ponderosa pine and retaining large-sized healthy and cull ponderosa pine. The proposed McKay and Luke Warm sales are located 6 miles from the Avon East proposal vicinity—likely too far to contribute to negative cumulative effects to flammulated owls. The Avon South #2 sale area is only 1 mile from the Avon East proposal area, but intervening habitats are extensive grassland, and therefore probably not potential flammulated owl habitat. Thus, these activities would not contribute to negative cumulative effects to flammulated owls. All 3 proposals favor retention of ponderosa pine and therefore would have a net cumulative benefit to owls.
Columbian Sharp-tailed Grouse	Unlikely that Columbian Sharp-tailed Grouse occur in the area, therefore no cumulative effects.	Unlikely that Columbian Sharp-tailed Grouse occur in the area, therefore no cumulative effects.
Ferruginous Hawk	No change to potential Ferruginous Hawk habitat. Large trees may be lost with time, but the birds could likely still find suitable nest sites. There would be no cumulative effects to this species with this alternative.	Other current or proposed sales in the vicinity are too distant (at least 6 miles away, McKay and Luke Warm), or would not affect grassland habitats (McKay, Luke Warm, Avon South #2). Ample nest trees would remain post-harvest in all proposals. Therefore, no negative cumulative effects would be expected.
Mountain Plover	This bird probably would not occur in the project area. Thus, there would be no cumulative effects to this species with the alternative.	This bird probably would not occur in the project area. Thus, there would be no cumulative effects to this species with the alternative.
Townsend's Big-Eared Bat	Snag habitat would gradually increase with tree competition stress. However, without thinning, the supply of large-sized snags (preferred for maternal roosts) would decrease with time, a cumulative decrease to bat habitat.	Thinning would decrease stress and increase retention of large trees and snags over time, a net cumulative benefit to bats. Other proposed sales in the vicinity are too distant (at least 6 miles away, McKay and Luke Warm) to contribute to negative cumulative effects for this species. Avon South #2 timber sale is within 1 mile of the proposal area. Harvest there (section 12) would include 30 unentered acres of mature ponderosa pine and Douglas-fir. In addition, large-sized trees would be retained post-harvest, so there would likely be no cumulative negative effect.

Other Sensitive Species

The following are sensitive species that are known to occur on State Trust Lands administered by the Southwestern Land Office. Potential habitat use by these species on the project area and in the vicinity was assessed. In addition, we examined the Montana Natural Heritage Program Database for records of these species in the project area. Due to limited available habitat, we consider the species would not likely occur near the project area. Therefore, no effects on any of these species are expected to occur as a result of this project.

Black-Backed Woodpecker- No recent stand-replacement burns or major insect infestations occur on or near project area. Therefore, no effects on this species are expected to occur as a result of this project.

Boreal Owl- High elevation spruce and fir habitat does not occur in the proposed project area. Although boreal owls have been found nesting in mixed conifer and Douglas-fir stands in Idaho (Hayward 1994), it is likely the stands in the proposal area are neither extensive enough nor high enough to support owls. Therefore, no effects on this species are expected to occur as a result of this project.

Coeur d' Alene Salamander- No fractured rock, waterfalls, or splash zones occur in the project area. Therefore, no effects on this species are expected to occur as a result of this project.

Common Loon- No usable lakes or ponds are near the proposed activity. Therefore, no effects on this species are expected to occur as a result of this project.

Fisher- High-quality fisher habitat consists of late-successional forests with dense canopies in close proximity to riparian areas. Elevations are usually less than 6,000 feet. The riparian area near the Little Blackfoot River is not extensive old growth coniferous forest. Thus, no preferred habitat occurs in the proposal area. Therefore, no direct or cumulative impacts to fisher are expected to occur as a result of this project.

Harlequin Duck- White-water habitat is absent from the proposal area. Therefore, no direct or cumulative impacts to Harlequin Ducks are expected to occur as a result of this project.

Lynx- Lynx have been studied in the Garnet Range, near the proposed project area. Potential denning habitat consists of relatively dense stands (at least 50% canopy closure) of mature to old growth structure at 5,000 feet elevation or higher, in spruce-fir habitats that contain numerous downed logs. No preferred habitat occurs in the project area. Thus, no appreciable direct or cumulative impacts to lynx are expected to occur as a result of this project.

Northern Bog Lemming- No fens, bogs or substantial moss-dominated areas are present. Therefore, no effects on this species are expected to occur as a result of this project.

White-Tailed Prairie Dog- This species is only known to occur near Bridger, MT, which is nowhere near the project area.

Other Considerations

Big Game

Affected Environment

Section 36 likely provides winter to spring range for big game. However, coniferous cover there is naturally fragmented, sparse, and occurs only in linear stringers—not a preferred configuration for big game habitat. In addition, a state highway separates the coniferous cover from the extensive riparian habitat of the Little Blackfoot River, which decreases the area's suitability for big game. None of the area qualifies as security cover. Although limited, coniferous cover in the section would contribute to habitat diversity and snow interception, important aspects to big game winter range.

Environmental Consequences, A No Action

Without harvest, thickets would continue to grow, resulting in increased competition stress. Large-sized trees would eventually die and be replaced by small- to medium-sized trees with smaller crowns. Without thinning, the medium-sized trees could not easily continue to grow to become future large-sized trees. In addition, without thinning, fuels would increase and increase the risk of stand-replacing fire. However, in order for the entire forested habitat to be "lost" in a stand-replacing fire, the fire would need to be carried through the natural fire breaks provided by the open grassland habitats. In summary, there would be no direct effect to big game habitat by this proposal. There may be a future cumulative decrease in snow interception, due to continued competition stress and loss of trees with large crowns.

Environmental Consequences, B Harvest

Thinning suppressed trees would reduce competition stress. Large-sized trees should be able to live on the site longer than if stands were not thinned. Overstory cover and snow interception should not be substantially reduced, because the largest trees would not be removed. In addition, snow interception should continue into the future, because thinning would help retain large trees longer. No permanent roads would be built, and those used would be closed after harvest. Therefore, access would remain as it is now.

In general there would be a small direct effect to large-sized tree habitat (and snow interception) by this proposal, because some medium sized trees would be removed by harvest. However, retaining all trees greater than 20 inches d.b.h. (except those removed incidentally for safety or skid trail placement) would mitigate negative effects. Also, not all of the habitat in section 36 would be entered. There would be a future cumulative benefit to large-sized tree habitat (and snow interception), from thinning suppressed trees and reducing competition stress. Because of natural fragmentation in the area and the relatively large distance (6 miles) from either McKay Creek or Luke Warm timber sales,

those actions would not contribute to any cumulative effects resulting from this proposed action. The Avon South #2 timber sale could potentially contribute to cumulative effects, because it is only 1 mile from the proposal vicinity. However, the area is naturally fragmented, so that small forested patches are separated by extensive grassland habitats. In addition, similar harvest is planned at Avon South #2, so that large-sized trees would be retained on site post-treatment. Also, 30 acres of mature ponderosa pine and Douglas-fir would be retained unentered in section 12 of Avon South #2, the section nearest to the proposal vicinity. Therefore, no negative cumulative effects to big game habitats are expected as a result of this proposal.

Goshawk

Affected Environment

Goshawks nest in relatively dense late-successional forests, usually in close proximity to water. Downed logs provide habitat for goshawk prey, and goshawks forage in a variety of forest structural stages including openings. The project area provides potential goshawk habitat, although the timbered stands may not be extensive enough to be preferred habitat for goshawks.

Environmental Consequences

No Action

Canopies would continue to close, and snags (and eventually coarse woody debris) would continue to be recruited to the area. These would have a positive cumulative benefit to goshawk habitat. However, without thinning, large-sized trees would decline in the future, a negative cumulative effect to goshawk habitat. Overall, there would be no direct and little measurable cumulative effect to goshawk habitat.

Harvest

Timber harvest would thin understories, a net cumulative benefit to goshawk habitat. Harvest activities may disturb wintering goshawks, but ample habitat would be available in unentered stands. Large-sized trees would be retained, so there should be no direct negative effects to suitable nesting habitat after harvest. Thus, no direct or cumulative negative effects to this species are expected to occur as a result of this proposal.

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